FIG. 1

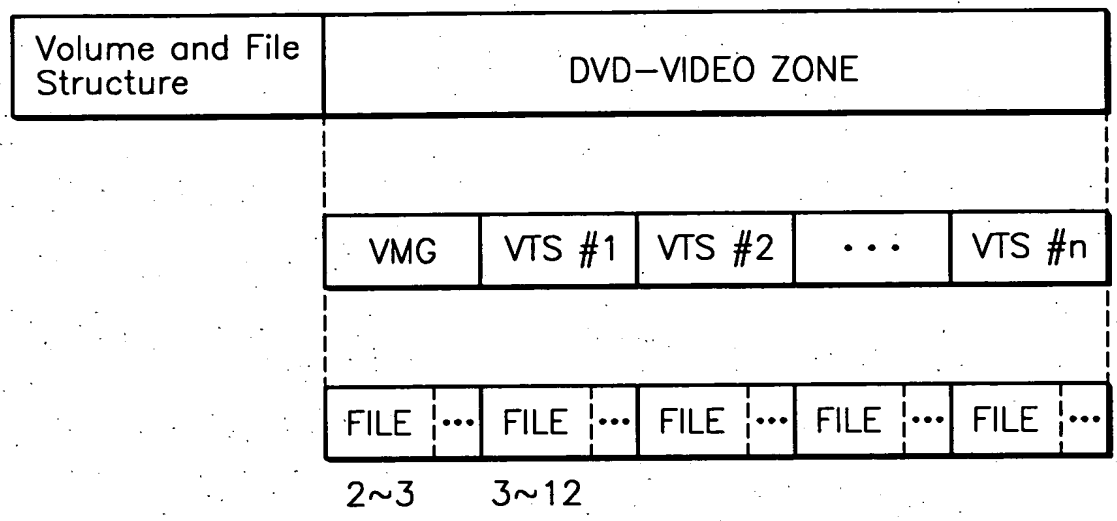

Volume and File Structure
DVD–VIDEO ZONE
VMG
VTS #1
VTS #2
• • •
VTS #n
FILE
FILE
FILE
FILE
FILE
2~3
3~12

FIG. 2

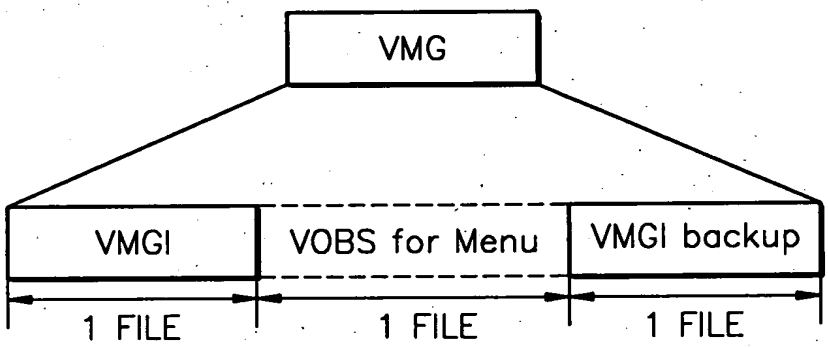

VMG
VMGI
VOBS for Menu
VMGI backup
1 FILE
1 FILE
1 FILE

FIG. 3

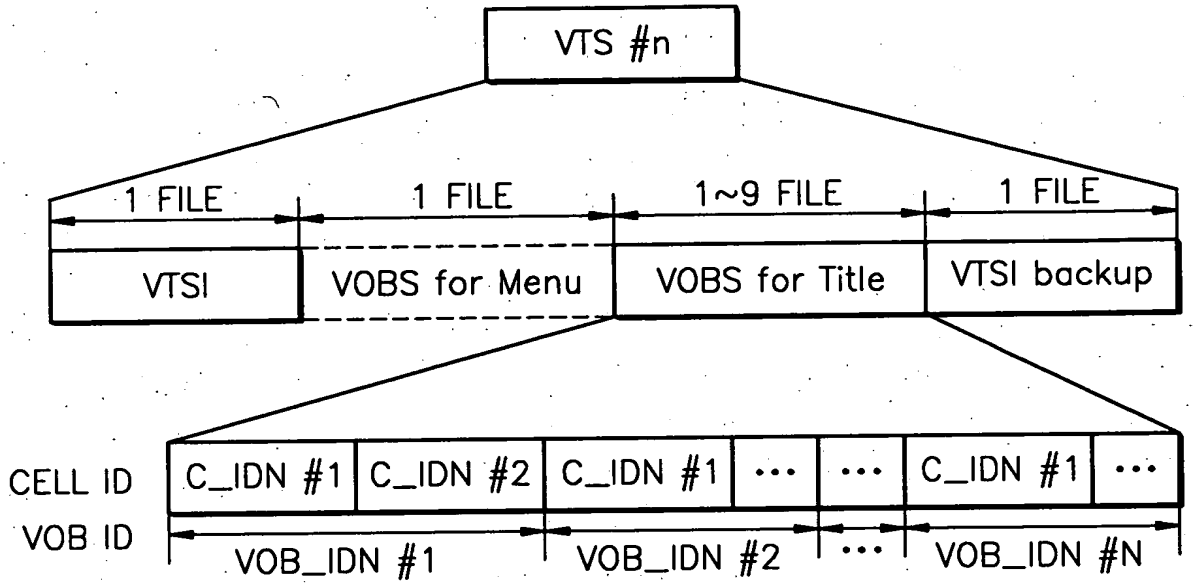

VTS #n
1 FILE
1 FILE
1~9 FILE
1 FILE
VTSI
VOBS for Menu
VOBS for Title
VTSI backup
CELL ID
VOB ID
C_IDN #1
C_IDN #2
C_IDN #1
C_IDN #1
VOB_IDN #1
VOB_IDN #2
VOB_IDN #N

FIG. 4

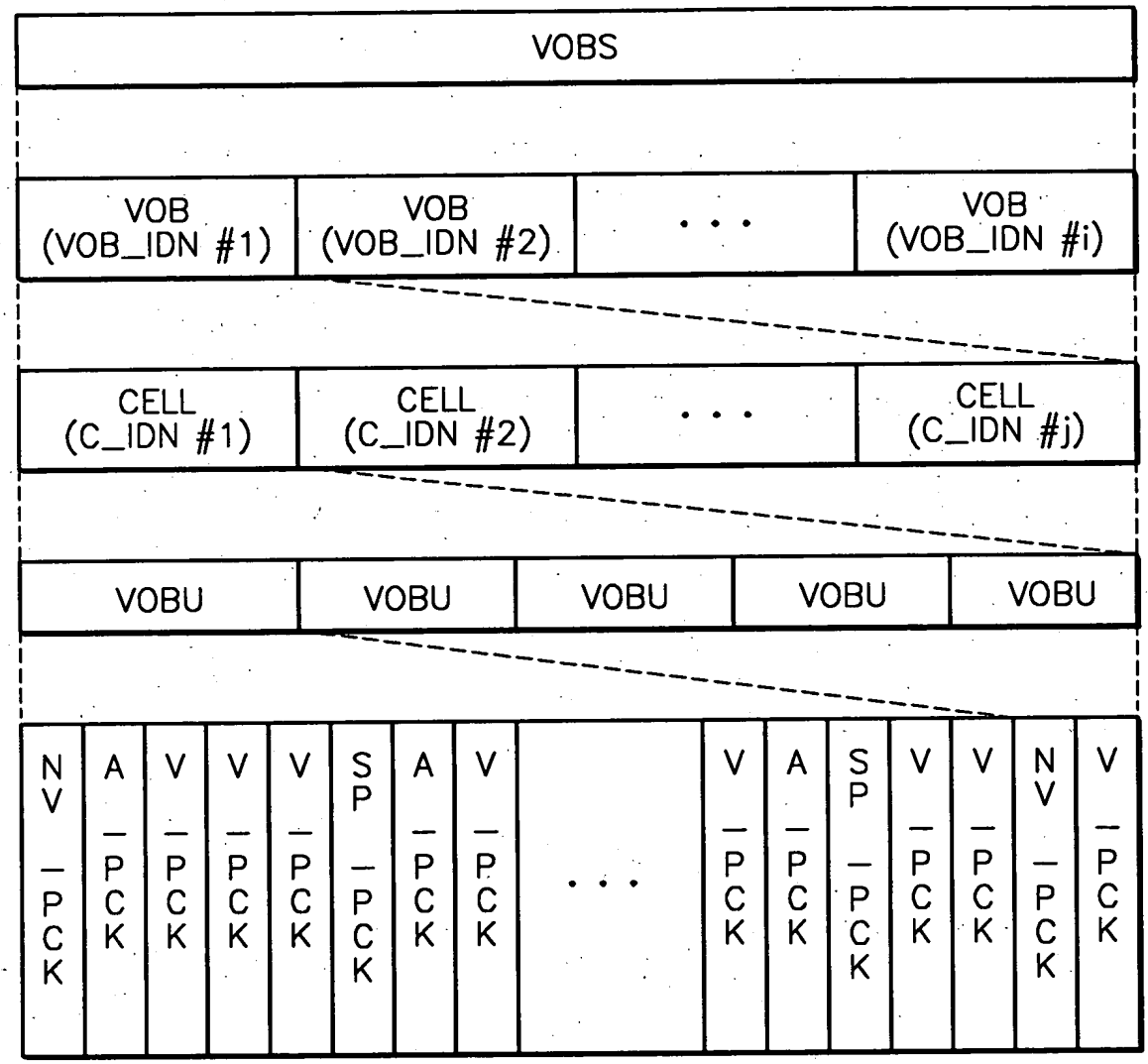

VOBS
VOB (VOB_IDN #1)
VOB (VOB_IDN #2)
. . .
VOB (VOB_IDN #i)
CELL (C_IDN #1)
CELL (C_IDN #2)
. . .
CELL (C_IDN #j)
VOBU
VOBU
VOBU
VOBU
VOBU
NV_PCK
A_PCK
V_PCK
V_PCK
V_PCK
SP_PCK
A_PCK
V_PCK
. . .
V_PCK
A_PCK
SP_PCK
V_PCK
V_PCK
NV_PCK
V_PCK

FIG. 5

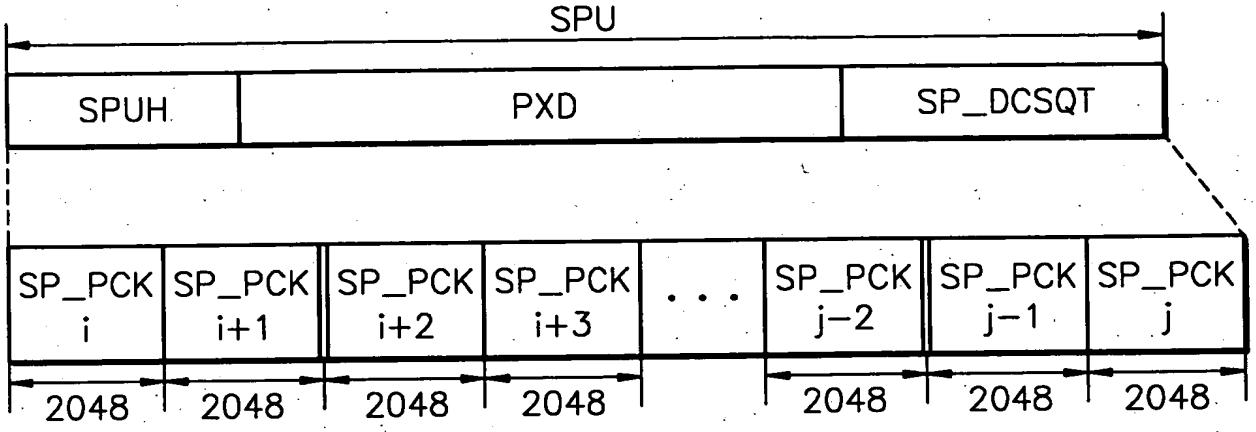

SPU
SPUH
PXD
SP_DCSQT
SP_PCK i
SP_PCK i+1
SP_PCK i+2
SP_PCK i+3
. . .
SP_PCK j-2
SP_PCK j-1
SP_PCK j
2048
2048
2048
2048
2048
2048
2048

FIG. 6

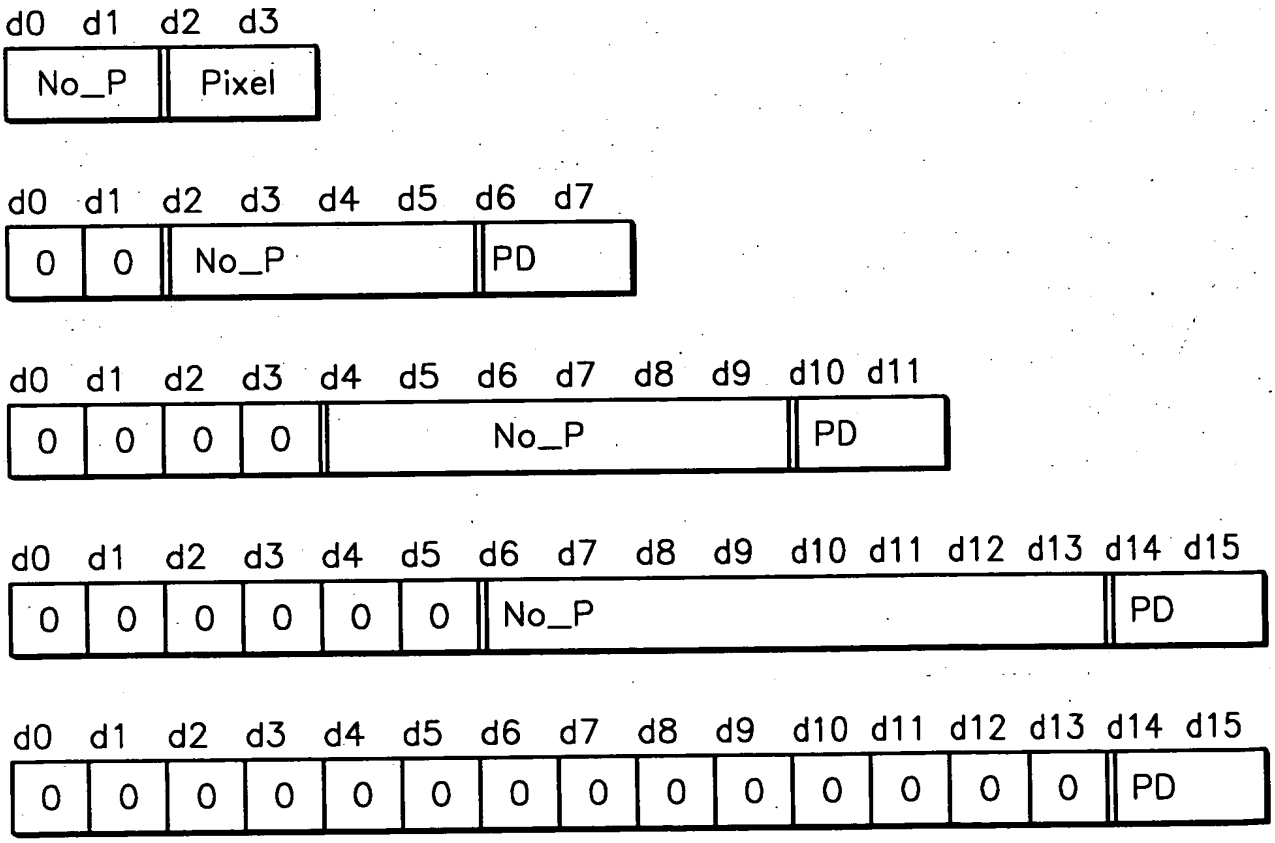

d0 d1 d2 d3
No_P
Pixel
d0 d1 d2 d3 d4 d5 d6 d7
0 0
No_P
PD
d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11
0 0 0 0
No_P
PD
d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15
0 0 0 0 0 0
No_P
PD
d0 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15
0 0 0 0 0 0 0 0 0 0 0 0 0 0
PD

FIG. 7

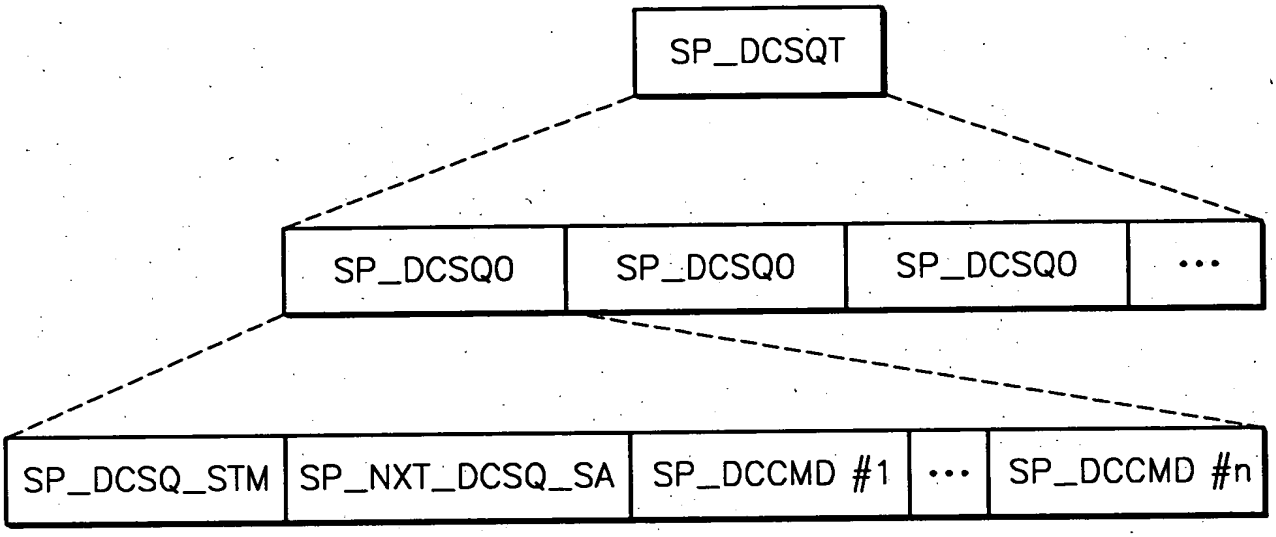

SP_DCSQT
SP_DCSQ0
SP_DCSQ0
SP_DCSQ0
...
SP_DCSQ_STM
SP_NXT_DCSQ_SA
SP_DCCMD #1
...
SP_DCCMD #n

FIG. 8

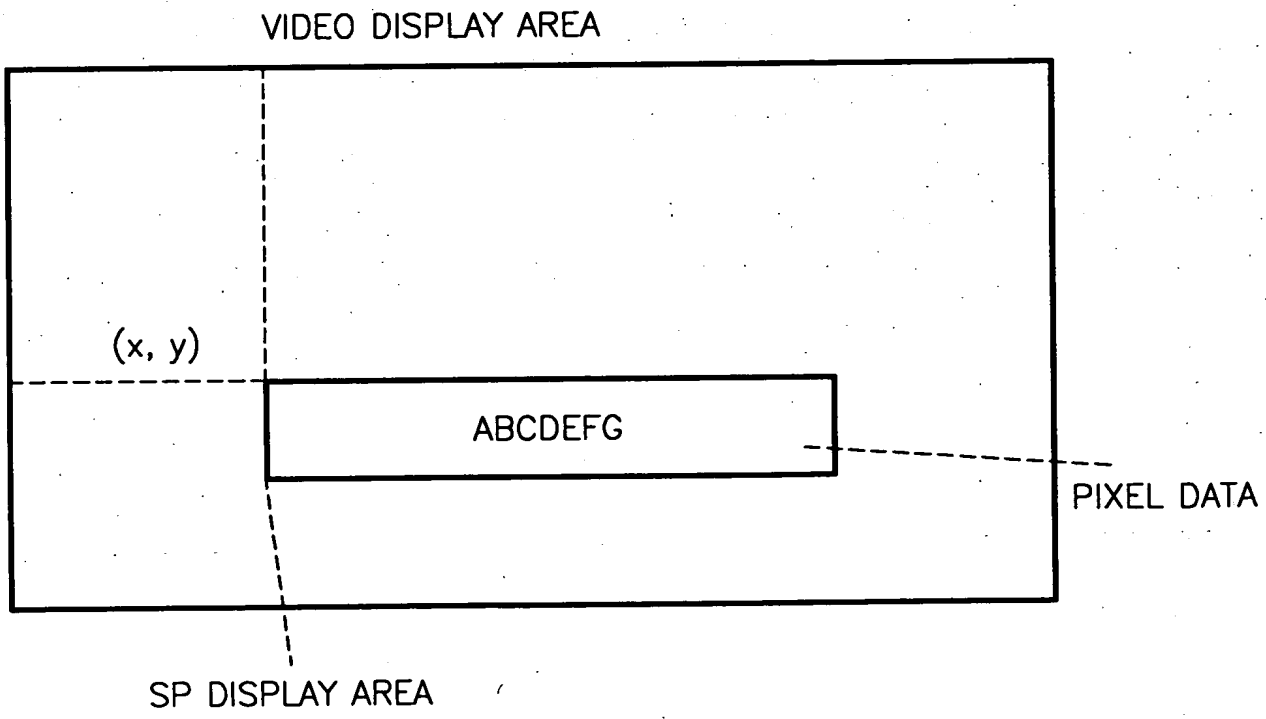

VIDEO DISPLAY AREA
(x, y)
ABCDEFG
PIXEL DATA
SP DISPLAY AREA

FIG. 9

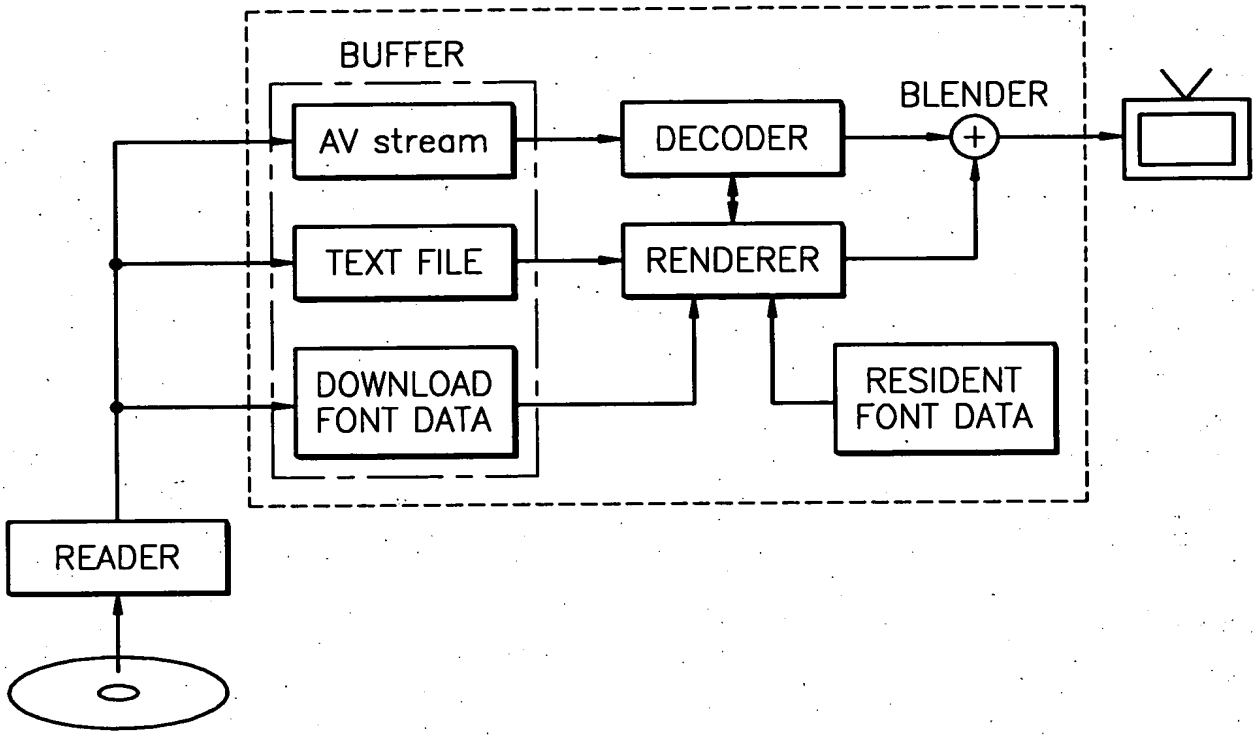

BUFFER
AV stream
TEXT FILE
DOWNLOAD FONT DATA
DECODER
RENDERER
BLENDER
RESIDENT FONT DATA
READER

FIG. 10

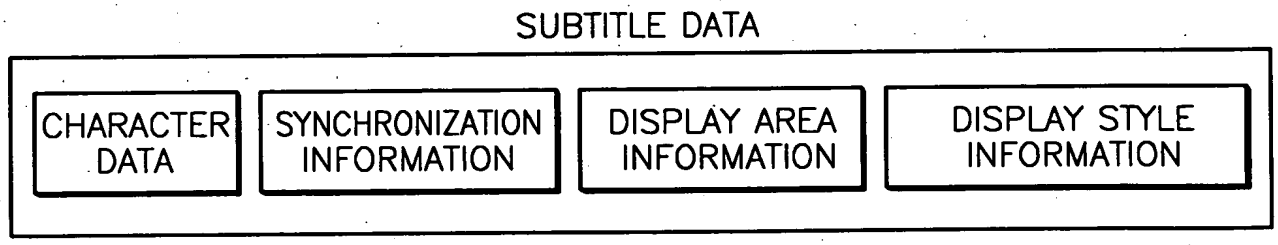

SUBTITLE DATA
CHARACTER DATA
SYNCHRONIZATION INFORMATION
DISPLAY AREA INFORMATION
DISPLAY STYLE INFORMATION

FIG. 11

```
<subtitle>
<head>
    <meta name="title" content="여름" />
    <meta name="language" content="korean" />
</head>

<body>
<p start="00:00:00" end="00:00:03" position="200, 380" direction="horizontal" size="520">
안녕하세요?
</p>
<p start="00:00:07" end="00:00:11" position="200, 380" direction="horizontal" size="520">
아? 예 뭐라고 말씀하셨죠?
</p>
.....
<p start="00:28:30" end="00:28:35" position="680, 50" direction="vertical" size="300">
10년이 지난 여름
</p>
.....
</body>
</subtitle>
```

FIG. 12

```
<subtitle>
<head>
    <meta name="title" content="Summer" />
    <meta name="language" content="english" />
</head>

<body>
<p start="00:00:00" end="00:00:03" position="200, 380" direction="horizontal" size="520">
Hello?
</p>
<p start="00:00:07" end="00:00:11" position="200, 380" direction="horizontal" size="520">
What did you say?
</p>
.....
<p start="00:28:30" end="00:28:35" position="200, 380" direction="horizontal" size="300">
10 years later
</p>
.....
</body>
</subtitle>
```

FIG. 13

```
<subtitle>
<head>
   <meta name="title" content="여름" />
   <meta name="language" content="korean" />
   <style type="text/css">
      p {
         margin-left: 8pt;
         margin-right: 8pt;
         margin-bottom: 2pt;
         margin-top:  2pt;
         text-align: left;
         font-size: 15pt;
         font-family: 굴림; 돋음;
         font-weight: bold;
         color:    #fee8c6; }
   </Style>
</head>

<body>
<p start="00:00:00" end="00:00:03" position="200, 380" direction="horizontal" size="520">
안녕하세요?
</p>
<p start="00:00:07" end="00:00:11" position="200, 380" direction="horizontal" size="520">
아?  예 뭐라고 말씀하셨죠?
</p>
.....
<p start="00:28:30" end="00:28:35" position="680, 50" direction="vertical" size="300">
10년이 지난 여름
</p>
.....
</body>
</subtitle>
```

FIG. 14

```
<subtitle>
<head>
   <meta name="title" content="여름" />
   <meta name="language" content="korean" />
   <style type="text/css">
      @user small {
                  p {
                     font-size: 15pt;
                     font-family: 굴림; 돋음;
                     font-weight: normal;
                     color:     #fee8c6; }
      }
      @user large {
                  p {
                     font-size: 25pt;
                     font-family: 굴림; 돋음;
                     font-weight: bold;
                     color:     #fee8c6; }
      }
   </Style>
</head>

<body>
<p start="00:00:00" end="00:00:03" position="200, 380" direction="horizontal" size="520">
안녕하세요?
</p>
<p start="00:00:07" end="00:00:11" position="200, 380" direction="horizontal" size="520">
아?  예 뭐라고 말씀하셨죠?
</p>
.....
<p start="00:28:30" end="00:28:35" position="680, 50" direction="vertical" size="300">
10년이 지난 여름
</p>
.....
</body>
</subtitle>
```

FIG. 15

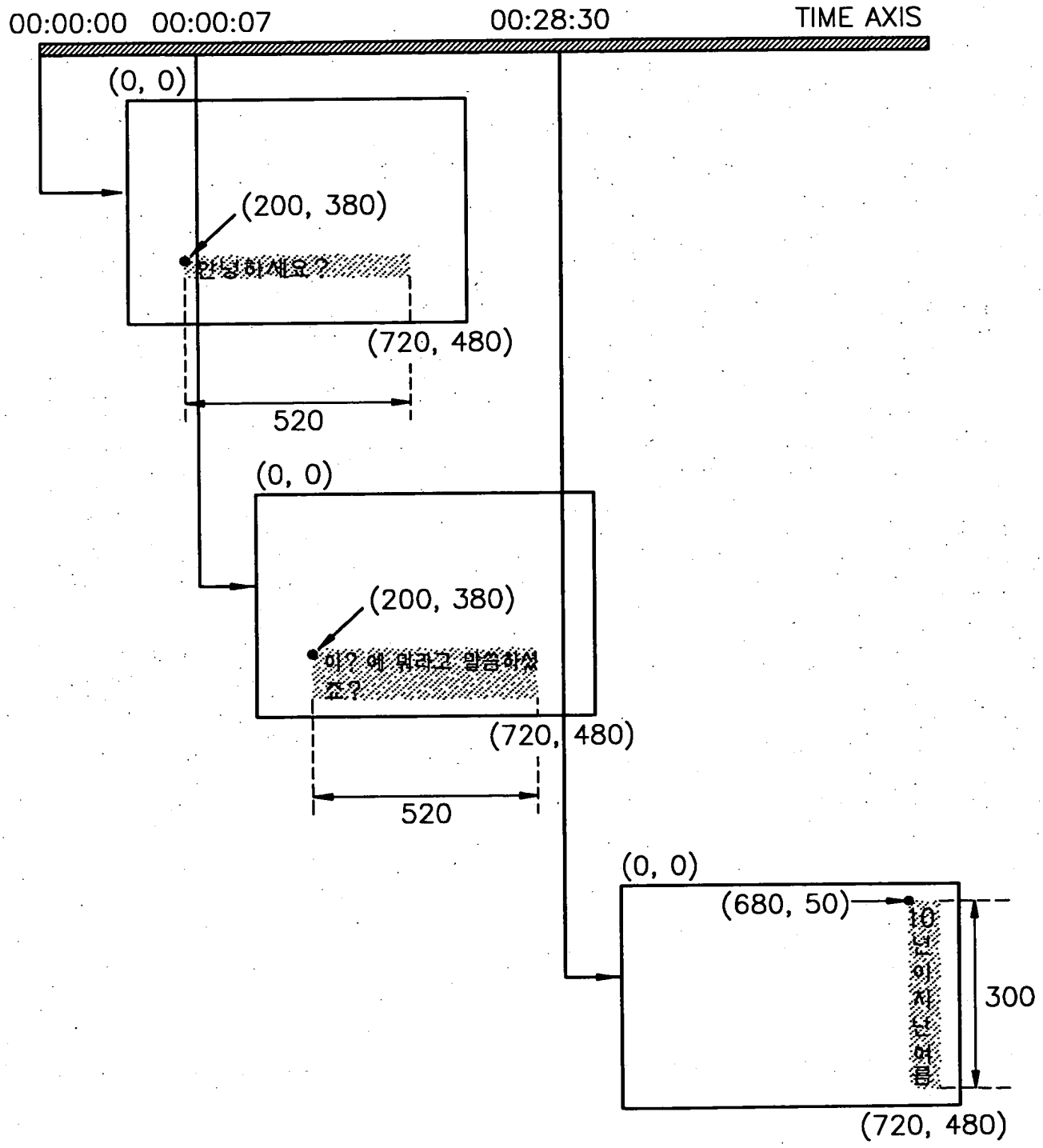

00:00:00
00:00:07
00:28:30
TIME AXIS
(0, 0)
(200, 380)
안녕하세요?
(720, 480)
520
(0, 0)
(200, 380)
이? 에 워라고 말씀하셨
죠?
(720, 480)
520
(0, 0)
(680, 50)
300
(720, 480)

FIG. 16

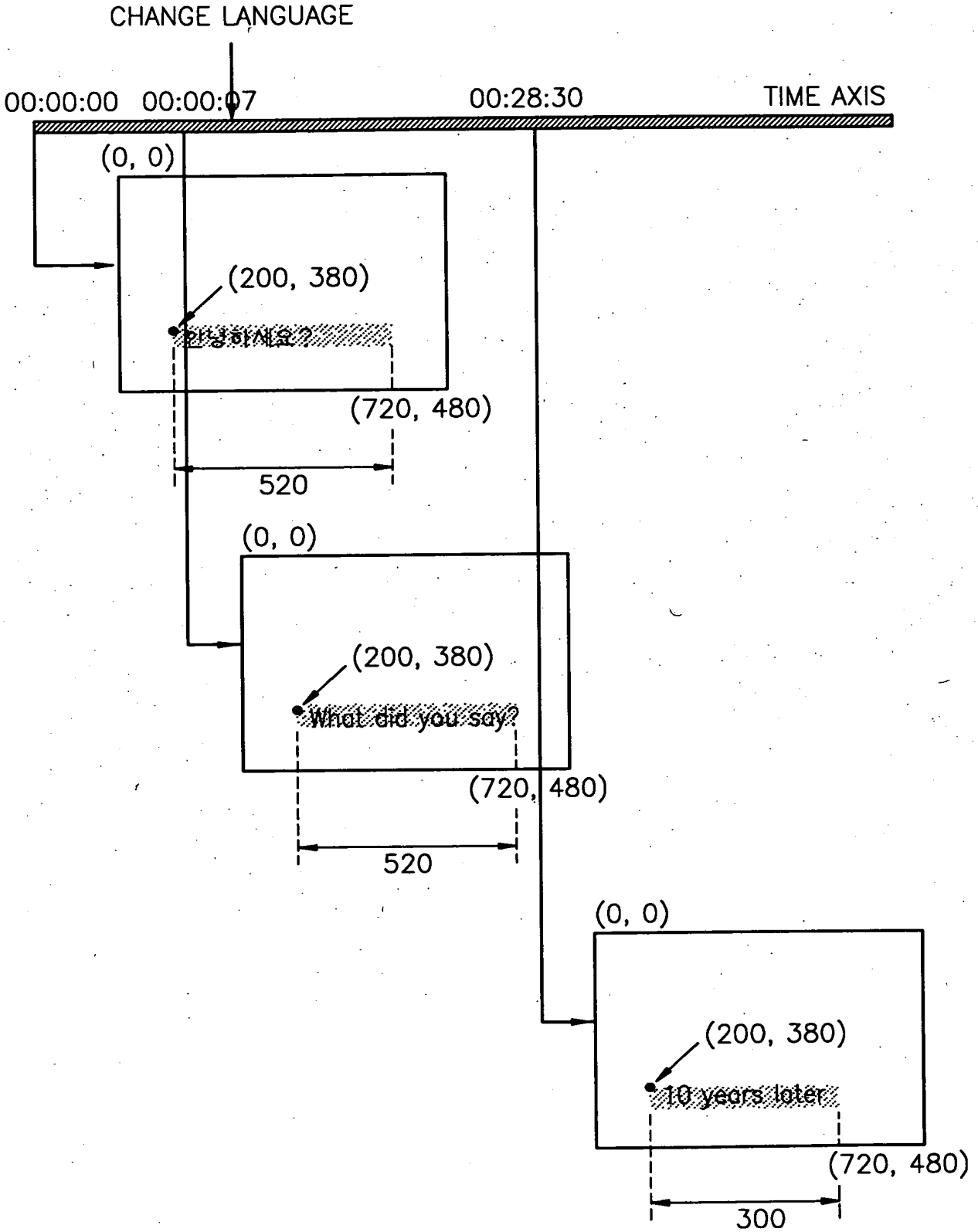

CHANGE LANGUAGE
00:00:00
00:00:07
00:28:30
TIME AXIS
(0, 0)
(200, 380)
안녕하세요?
(720, 480)
520
(0, 0)
(200, 380)
What did you say?
(720, 480)
520
(0, 0)
(200, 380)
10 years later
(720, 480)
300

FIG. 17

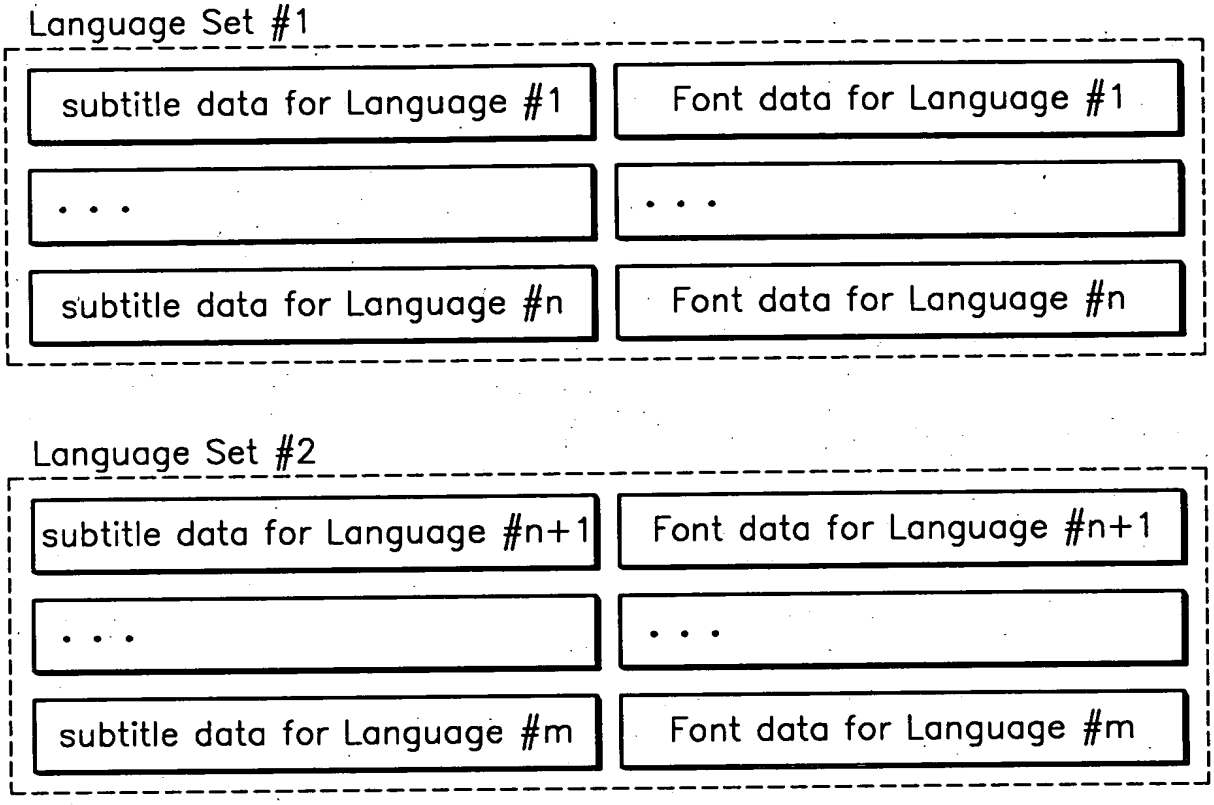

Language Set #1
subtitle data for Language #1
Font data for Language #1
. . .
. . .
subtitle data for Language #n
Font data for Language #n
Language Set #2
subtitle data for Language #n+1
Font data for Language #n+1
. . .
. . .
subtitle data for Language #m
Font data for Language #m

FIG. 18

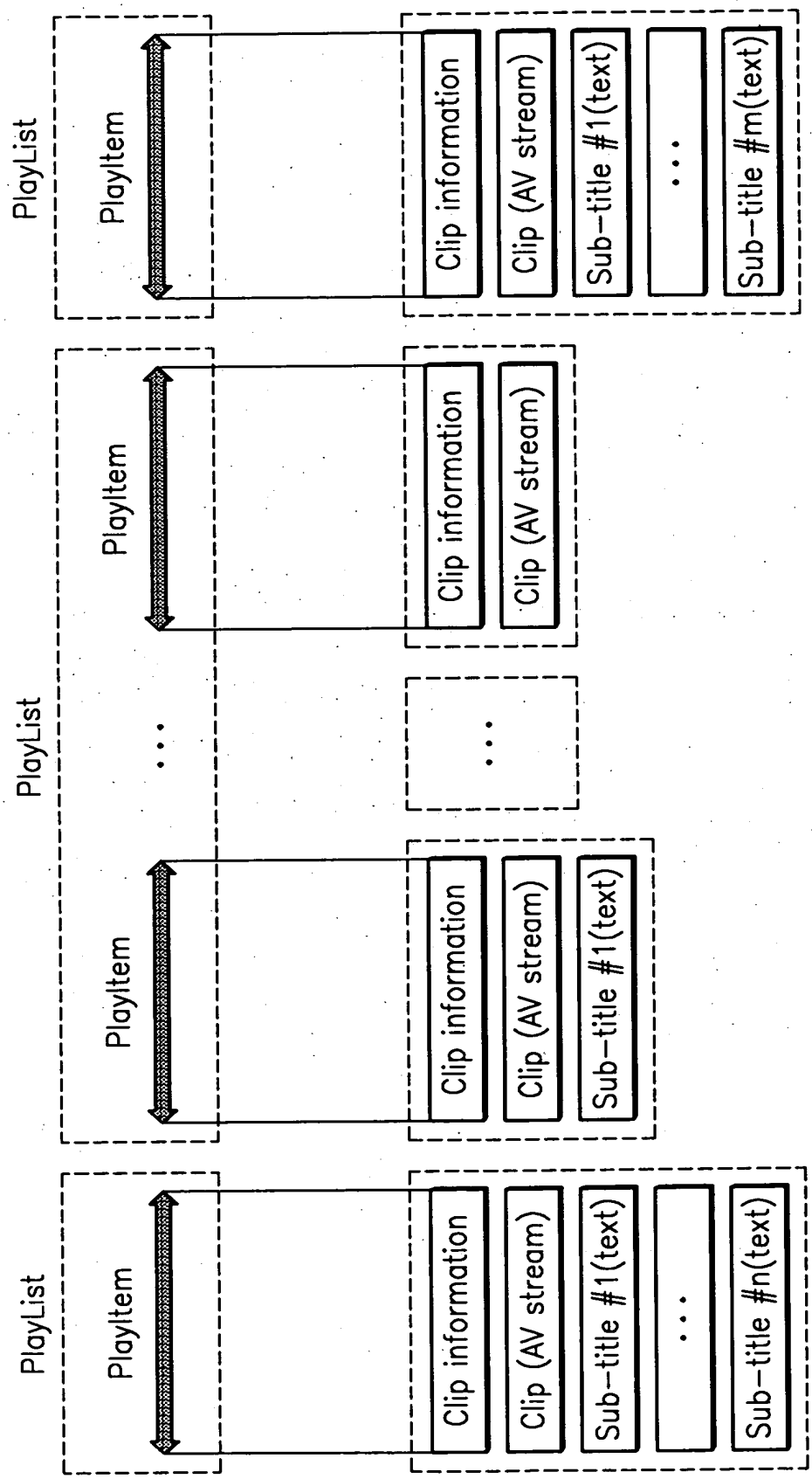

PlayList
PlayItem
Clip information
Clip (AV stream)
Sub-title #1(text)
...
Sub-title #m(text)
PlayList
PlayItem
Clip information
Clip (AV stream)
...
PlayItem
Clip information
Clip (AV stream)
Sub-title #1(text)
PlayList
PlayItem
Clip information
Clip (AV stream)
Sub-title #1(text)
...
Sub-title #n(text)

FIG. 19

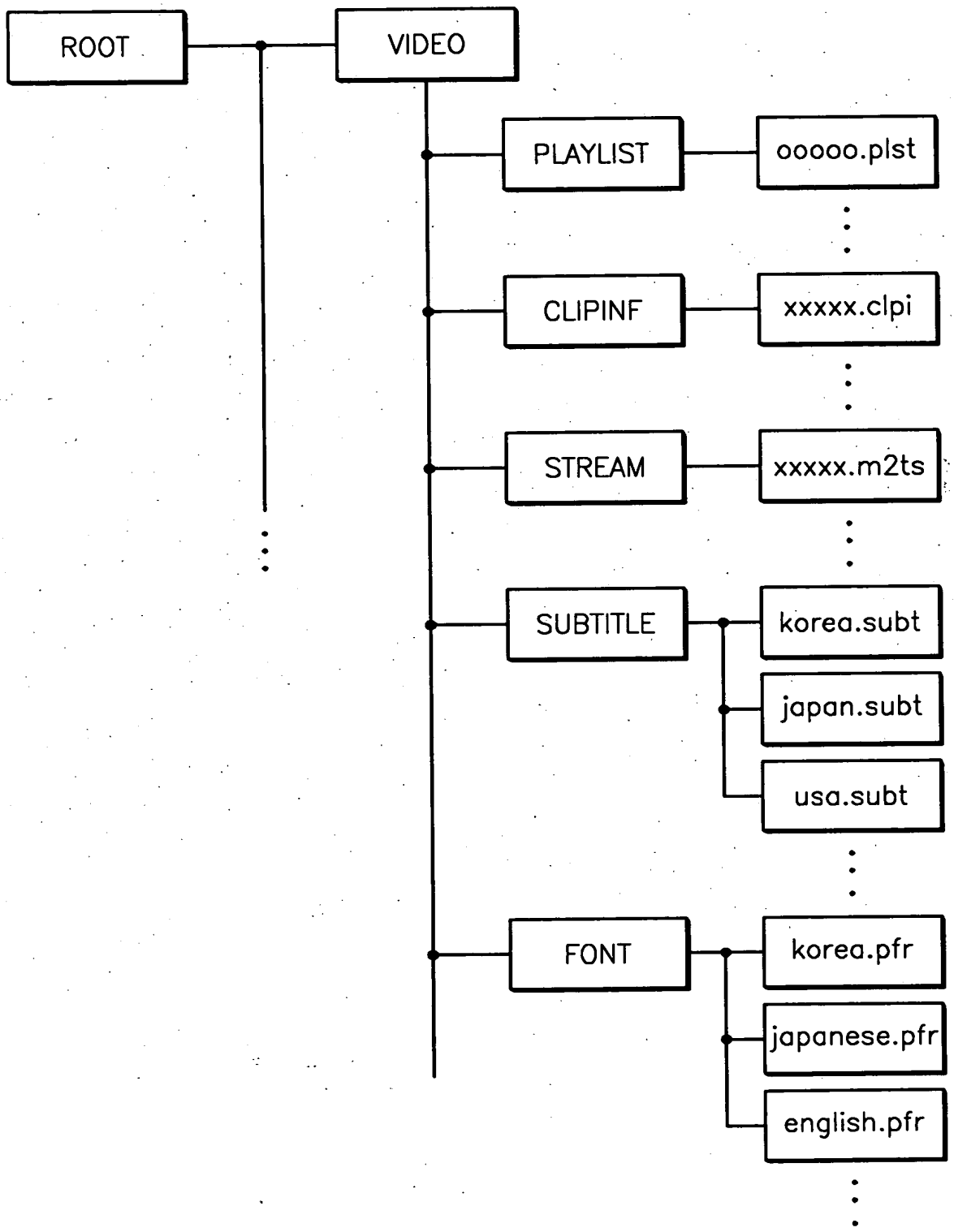

ROOT
VIDEO
PLAYLIST
ooooo.plst
CLIPINF
xxxxx.clpi
STREAM
xxxxx.m2ts
SUBTITLE
korea.subt
japan.subt
usa.subt
FONT
korea.pfr
japanese.pfr
english.pfr

FIG. 20

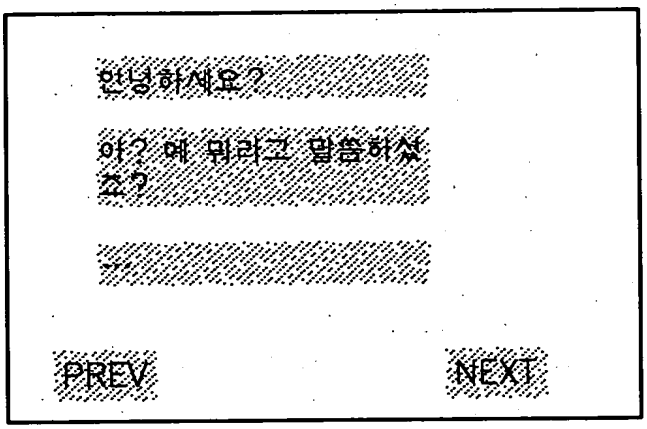

안녕하세요?
아? 예 뭐라고 말씀하셨
죠?
PREV
NEXT

FIG. 21

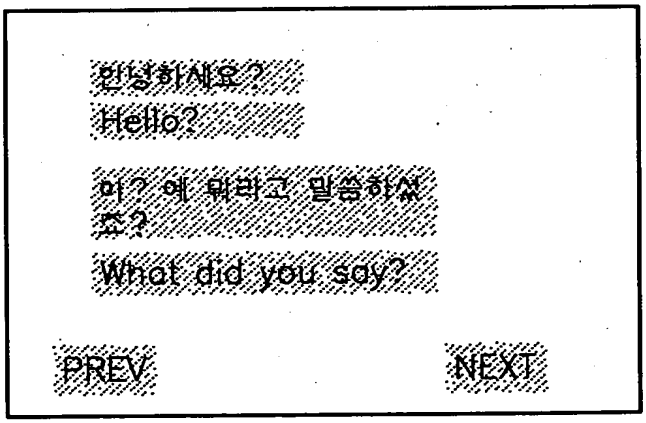

안녕하세요?
Hello?
아? 예 뭐라고 말씀하셨
죠?
What did you say?
PREV
NEXT

FIG. 22

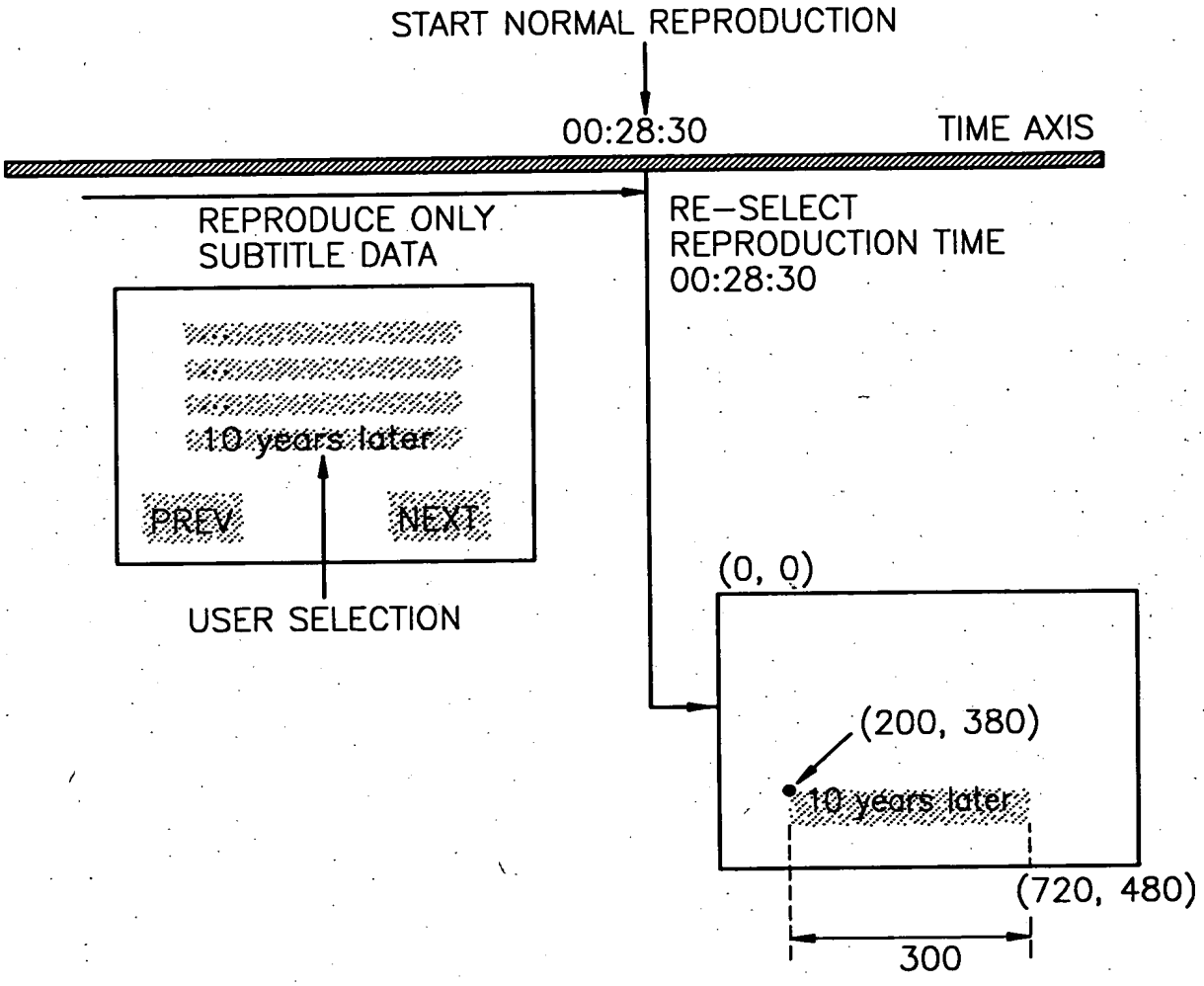
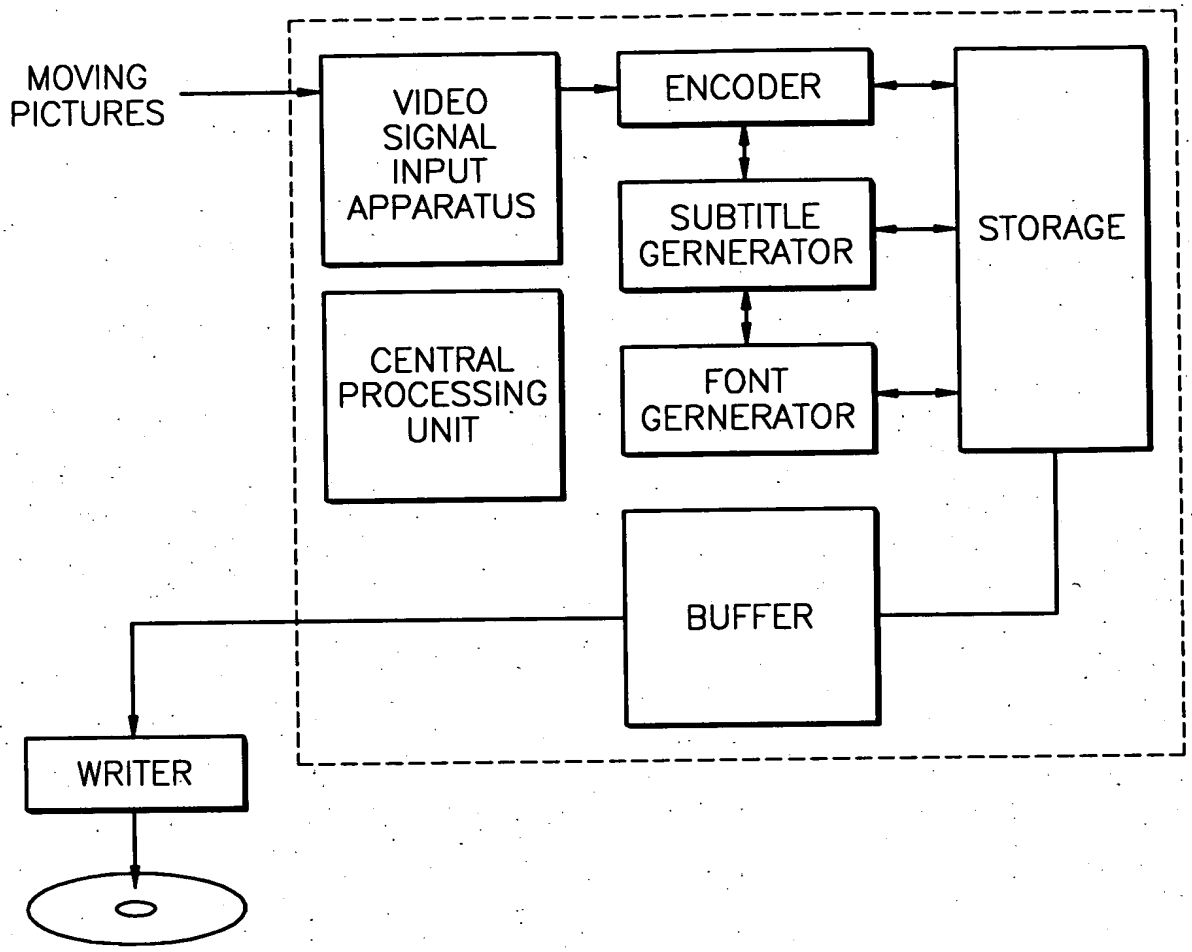

START NORMAL REPRODUCTION
00:28:30
TIME AXIS
REPRODUCE ONLY SUBTITLE DATA
RE-SELECT REPRODUCTION TIME 00:28:30
10 years later
PREV
NEXT
USER SELECTION
(0, 0)
(200, 380)
10 years later
(720, 480)
300

FIG. 23


MOVING PICTURES
VIDEO SIGNAL INPUT APPARATUS
ENCODER
SUBTITLE GERNERATOR
FONT GERNERATOR
STORAGE
CENTRAL PROCESSING UNIT
BUFFER
WRITER